OUTBREAK SPOTLIGHT….

"Outbreak Spotlight" is a regularly appearing feature in the *Indiana Epidemiology Newsletter* to illustrate the importance of various aspects of outbreak investigation. The event described below is an example of a propagated outbreak, and highlights how closed populations can serve as "sentinels" for health events in a community.

It Just Keeps Going, and Going, and Going . . . .

Outbreak of Viral Gastroenteritis in a Long Term Care Facility

Background

On February 21, 2002, a representative of the County X Health Department notified the Indiana State Department of Health (ISDH) that several residents at Facility A had developed symptoms of gastroenteritis, characterized primarily by diarrhea and vomiting, since mid-January. Facility A is a comprehensive care facility that includes approximately 175 residents throughout several wards and approximately 210 staff.

Epidemiologic Investigation

The ISDH and the County X Health Department (CXHD) conducted a collaborative investigation of this outbreak. The ISDH developed a questionnaire that documented illness history on the days in question. The CXHD conducted resident medical record reviews and distributed the questionnaire to staff members who also reported ill. Completed questionnaires were returned to the ISDH Epidemiology Resource Center for analysis. A case was defined as any previously healthy person who became ill with diarrhea and/or vomiting on or after January 15. Any person who was ill for any other reason or who became ill with symptoms that did not include diarrhea or vomiting was not considered as a case.

Approximately 39 residents and 38 staff members were reported ill. Thirty-eight residents and 34 staff members met the case definition. Symptoms reported by the 72 cases included diarrhea (94%), nausea (84%), vomiting (80%), abdominal cramps (55%), body aches (52%), and fever (50%; median: 100.5°F; range: 99.0°F to 102.0°F). Other symptoms included headache and chills. The median duration of illness was 22.0 hours, with a range of 5.5 hours to 111.5 hours. Eight residents and five employees sought medical attention, but no one was hospitalized overnight. A representative from CXHD delivered stool collection containers, and ten residents submitted stool specimens for laboratory analysis (see "Laboratory Results"). The median incubation period of illness was undetermined.

Environmental Assessment

Facility A reported conducting in-service training on hand washing on February 21 and 22 and restricted employees from "floating" between wards on February 21. All ill residents were confined to their rooms. A representative from the CXHD visited the facility on February 22 to review infection control practices. All activities were curtailed, and the beauty parlor was closed. All residents, regardless of illness status, were confined to their rooms.

During the same day, a representative from CXHD inspected the food preparation area. No violations were noted. Patients were served meals in their rooms rather than in the common dining areas. Food temperatures measured within the proper range, and the two-hand washing sinks were functioning properly. Sanitizer levels measured within proper range, sanitizing logs had been properly maintained throughout the month, and wiping cloths were used with sanitizing solution. Refrigeration equipment was clean and working properly. The dietary staff was instructed to continue to enforce hand-washing practices, monitor sanitizing procedures with utensils, equipment, and wiping cloths, and exclude any ill employees.

Cases continued to be reported. On February 23, a representative of the ISDH visited the facility to review infection control practices. The surveyor verified that all residents in the facility were restricted to their rooms. Meals were served in residents' rooms and the beauty shop was closed. No federal deficiencies or state violations were noted.

Additional cases were still identified. A representative from CXHD visited the facility on February 27 to review the situation. The facility appeared clean, restrooms were clean, and residents were dressed and ambulatory. Residents were still confined to their units and served meals in their units. Staff members were eating in the dining rooms. Hand washing signage was posted, and visitors were encouraged to wash hands. Employees were furnished with an alcohol-based hand gel for individual use. Applesauce used in administering medications was portioned into covered containers and served with individual spoons. The housekeeping staff continued disinfecting common areas. A hand washing in-service presented by the CXHD health educator was scheduled for the following week.

Since staff members continued to report illness, a hand washing in-service training was scheduled for all staff on March 1. Managers were required to complete a test on information regarding viral gastroenteritis. They also continued to enforce hand washing with employees and supervise residents washing their hands. The CXHD notified employees that dining and activity restrictions could not be lifted until no new cases were reported for four consecutive days.

On March 11, the CXHD health educator provided hand washing in-service training for all residents and 70 employees. On March 12, the director of nursing at the facility reported to the CXHD that no residents had been reported ill for the last week, and no employees had reported ill for the last four days. At that time, the outbreak was declared over.

Laboratory Results

Ten residents submitted stool specimens to the ISDH Laboratories for analysis. All specimens tested negative for *Salmonella, Shigella, Campylobacter* and *E. coli* O157:H7. Four of the ten specimens tested positive for Norwalk-like virus (now renamed as Norovirus).

Conclusions

This investigation confirms that an outbreak of gastroenteritis occurred among residents and staff at Facility A from January 30-March 1. The only consistent common exposure among the cases during this time was association with Facility A.

The causative agent of this outbreak was Norwalk-like virus. The symptoms experienced (diarrhea, nausea and vomiting) are typical of viral outbreaks. Viral pathogens generally have an incubation period ranging from 24 to 48 hours and duration of symptoms ranging from 12 to 60 hours. The median duration of illness reported was 22.0 hours. Most common bacterial agents of gastroenteritis generally have either a shorter incubation period (i.e., *Bacillus cereus*, *Staphylococcus aureus*, or *Clostridium perfringens*) or a longer duration of symptoms (i.e., *Campylobacter*, *Salmonella*, *Shigella*, or *E. coli* O157:H7). Although six specimens tested negative for viral pathogens, it is possible that those residents were no longer shedding virus at the time of specimen collection. The incubation period for this outbreak was not determined.

Viral agents of gastroenteritis are found only in humans and are shed through stool. Foodborne viral outbreaks usually occur when an infected food handler with inadequately washed hands prepares food that is served raw (i.e., salads, vegetables, etc.) or that is handled extensively after cooking (i.e., sliced sandwich meats, rolls, etc.). In addition, viral gastroenteritis is also easily transmitted person-to-person, and viral agents can be shed up to two weeks after symptoms cease.

The epidemic curve (see figure 1) depicting the onset dates of cases indicates that this outbreak was most likely transmitted person to person. In point-source outbreaks, including foodborne, many cases become ill simultaneously shortly after one particular exposure, such as a contaminated food item, and resolve rather quickly. In addition, the one dietary staff member reported ill had an onset date during the outbreak, rather than before the outbreak, and no violations were noted in the food preparation area. In propagated outbreaks, including person-to-person, cases become ill at different times, usually in "waves", resulting from exposure to more than one source. These "waves" of illness are generally separated by one incubation period of the agent, and transmission may occur throughout different areas of a facility. This is the type of pattern observed.

Illness may have been introduced into the facility by an asymptomatic person or unidentified symptomatic person, such as a visitor. At least two staff members reported having contact with ill family members before becoming ill themselves. This would indicate that a similar infection was circulating in the community during this time. Due to the infectious nature of these viral agents and the typically short incubation period, infection can spread rapidly among residents and staff in a closed population, despite stringent control measures. Apparent outbreaks of diarrheal illness in institutional settings should be reported to the local health department as soon as possible. This allows the causative agent to be identified and control measures to be implemented quickly. These investigations also allow Indiana public health professionals to gain more information about viral agents of gastroenteritis, such as seasonal occurrence, frequency of infection, circulation within a community, and the burden of illness in elderly and/or compromised populations.

In general, most person-to-person viral outbreaks of gastroenteritis in institutional settings can be prevented by strictly adhering to the following practices:

1. Thoroughly wash hands with soap and water before preparing food, before eating, after using the restroom, after assisting someone to use the restroom, and cleaning soiled areas.
2. Thoroughly wash hands with soap and water after caring for people ill with diarrhea and vomiting.

3. Exclude employees from working while ill with diarrhea and/or vomiting until symptoms have ceased.
4. Thoroughly disinfect common use areas, such as handrails, doorknobs, and restrooms, using an approved disinfectant.
5. Restrict ill residents from common areas, such as dining rooms and activity sites.

Figure 1.